

The Use of LASER-Generated Electron Skyrmions in Planar Materials to Achieve Radio-Direction-Finding Function with Extreme Precision

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As experimentally demonstrated at L'École polytechnique fédérale de Lausanne (EPFL) <https://actu.epfl.ch/news/controlling-skyrmions-with-lasers/> in 2018, electron skyrmions may be generated and controlled via LASER light in planar materials.

I propose that these skyrmions, amongst other things, may be used in order to support precision radio-direction-finding.

A radio direction finder may be constructed on the basis of the placement of four electron skyrmions in the four quadrants created by a plus-sign-shaped divider, each of which has a sensitive detector plate affixed to its walls. Each quadrant is responsible for the discrimination of radio signals from its respective 90-degree portion of the overall field of view.

As incoming radio signals pass through a skyrmion, which features electrons flowing at 10-15% of C in both the direction of the radio source and the direction of the detector, half of the incoming waves must pass through electrons which are moving toward it and the other half, must, necessarily, pass through the hemisphere of the vortex featuring electrons moving away from it. Each hemisphere would have a different frequency-modulating effect upon the waves.

The portion of the waves passing through the electrons moving toward them would be stepped up in their frequency, but the portion passing through electrons moving in the same general direction would be stepped down in frequency.

This would cause EM of a single frequency to be stretched so that a "rainbow" of frequencies strike the detector in different positions, which a defined boundary between the up-stepped and the down-stepped portions being readily discernible to the detector. Where, exactly, this boundary rests would inform the operator of this novel RDF mechanism of the source of the electromagnetic signal.

The mechanism may be further refined by incorporating additional skyrmions behind the primary skyrmion which would serve to clarify the boundary position between the up- and down-shifted portions of the waves by acting as an electromagnetic lens which projects a magnified impression of the EM against the detector, much as an optical projector lens can project an inflated image against a projector screen.

When combined with phase drift analysis supported by precision timing mechanisms, range information could, additionally, be gathered without the more conventional method of using triangulation.

This skyrmion technology could also be used to block undesired signals coming from any direction other than legitimate sources as skyrmions, at higher power levels, can be used in order to entirely subsume electromagnetism. Three-dimensional matrices of skyrmions are capable, through their mutual alignments, of entirely subsuming or scattering electromagnetism coming from specific directions. Thus, this RDF mechanism would be capable both of ascertaining the exact geospatial source of a jamming signal and of filtering that signal, if equipped with the more sophisticated skyrmion matrix system.